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AN  
INAUGURAL DISSERTATION  
ON THE  
APOPLEXY.

SUBMITTED TO THE EXAMINATION  
OF THE  
REV. JOHN EWING, S. T. P. Provost,  
THE  
TRUSTEES AND MEDICAL PROFESSORS  
OF THE  
UNIVERSITY OF PENNSYLVANIA,

For the DEGREE of  
DOCTOR OF MEDICINE,  
On the 8th Day of May, 1793.

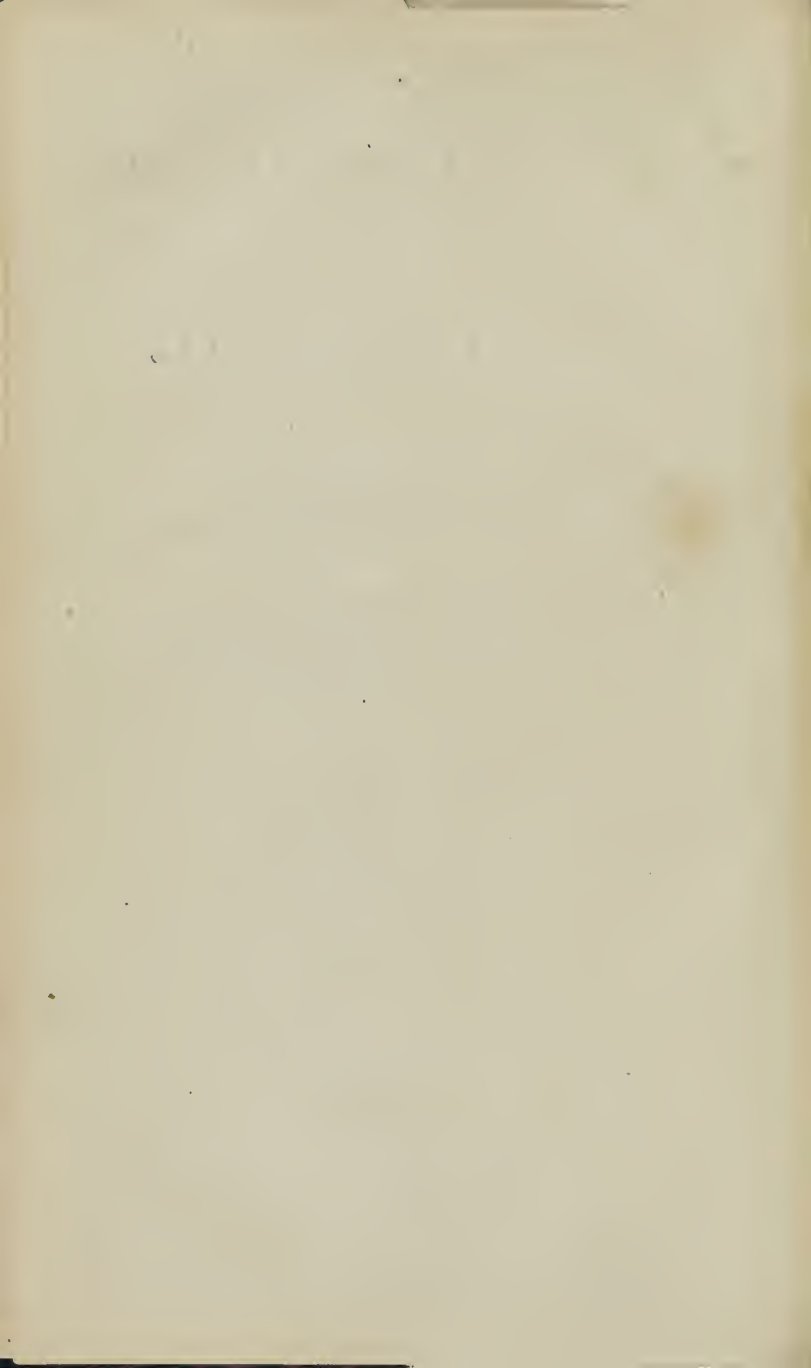
BY  
JOHN ANDREWS,  
OF PENNSYLVANIA.

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M.DCC.XCIII.



T O

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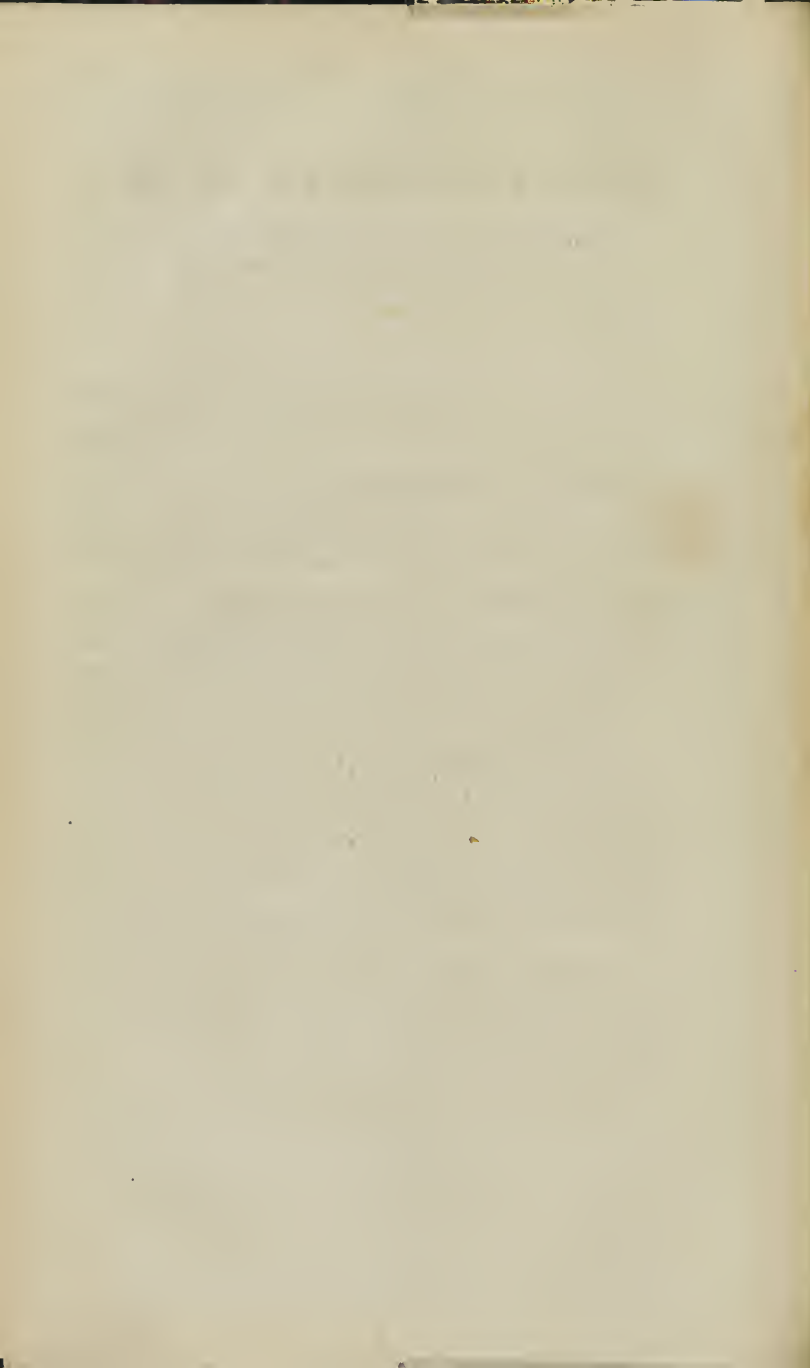
S I R,

IN addressing you in the style of a Dedication, I have no other end than to express a lively gratitude for the favours I have received at your hands. Under your directions I have prosecuted my medical studies; and I rejoice in contemplating the opportunity I have had of participating in the advantage to be derived from the attention and abilities which are so peculiarly marked in your instructions. But the efficacy of precepts is not entirely confined to their internal merit. There is an affability of manners, and a kindness of attention, which renders instructions at the same time impressive and agreeable. In these qualities, you, Sir, are distinguished, and these have softened the professional labours of

Your obliged Friend and PUPIL,

JOHN ANDREWS.

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A N  
INAUGURAL DISSERTATION  
ON THE  
A P O P L E X Y.

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DEFINITION.

**T**HIS disease, as defined by Dr. *Cullen*, is a suspension of almost all *voluntary motion*, attended with sleep, which is more or less profound, while respiration and the action of the heart and arteries continue.

HISTORY.

It attacks both sexes, and sometimes persons in youth and middle life, but generally those who are advanced in years.

It is observed that people who are of a peculiar make and habit, are more predisposed to this disease than others, most generally those who have large heads and short necks, more especially if they be of very irritable habits.

PERSONS who are of a corpulent habit of body, and those who have lived in indolence, used

ed a full diet, and made too free use of intoxicating liquors, are also particularly subject to this disease.

APOPLEXY is most common in cold winters, or warm springs succeeding cold winters\*.

THIS disease commonly attacks suddenly, and the person affected falls to the ground in a comatose state, for the most part deprived of all voluntary motion, at times one side is only thus affected, while the other appears convulsed, the face is often distorted, and the intellectual functions are in general compleatly suspended.

THE pulse is frequently full, strong, and slow, sometimes it is small and feeble, this latter state however generally takes place towards the termination of the disease.

THE cheeks are of a peculiar red and florid colour, the face swells, the vessels about the head, and particularly the temples, are always distended with blood, and frequently an hæmorrhage takes place from the nose, mouth and ears, which generally gives relief to the patient; the eyes are often turgid, and pour forth tears, sometimes they are half open, and appear glassy. The  
jaw

\* *Morgagni* relates that an uncommon number of cases happened suddenly at Padua, in May 1729. He observes, "that the weather was considerably hot, and became so suddenly after a long continued cold and damp season;" and adds, that "the autumn, the winter and spring had been rainy till that time."

jaw frequently falls open, and the tongue which is swelled, protrudes between the teeth.

THERE is sometimes an involuntary discharge of fæces and urine, but commonly these excretions are retained.

THE respiration is difficult and laborious, and is sometimes attended with a peculiar noise called stertorous, which may be owing to an extreme degree of relaxation in the palatum molle, and uvula, in consequence of which they interrupt the free passage of air to and from the glottis. The skin is frequently dry and hot.

APOPLEXY may terminate in three different ways. 1. In death, which is preceded for the most part with vomiting, cold sweats, and convulsions. 2. In another disease, as palsy, with a loss of some of the internal senses, as of the memory, &c. which takes place frequently when death does not strike the fatal blow; 3dly and lastly, in health; but this happens more rarely.

THERE are certain precursory symptoms which indicate an approaching paroxysm, viz. the whole body becomes affected with unusual dulness, with a diminution of sense and motion in the extremities, and the patients are affected with the sensation of pricking, or as if insects were creeping upon them; there is generally a violent pain in  
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the head, a founding in the ears called tinnitus aurium, frequent fits of giddiness, some interruption in seeing and hearing, hæmorrhagy from the nose, drowsiness, loss of memory, and frequent fits of incubus. There is sometimes a stridor dentium when the patient is asleep, and also an inflation or sense of fulness of the face and neck, with a slight degree of false vision, tremors in most of the organs of voluntary motion, and an unusual absence of the piles in those who are subject to that disorder.

## DIAGNOSIS.

*Nosological* writers commonly distinguish apoplexy into different species, particularly into sanguineous and serous: but to me there appears great difficulty in this distinction, as there is no difference in their symptoms, and it is only after death that we can determine, whether the effusion is of blood or serum; serous effusions sometimes take place in florid people, and vice versa.

*Carus, Lethargus, Cataphora,* and *Coma* unattended with fever, are only inferior degrees of Apoplexy.

APOPLEXY is distinguished from Palsy, by the suspension of the whole of the powers of sense and voluntary motion, and from syncope by the continuance of the action of the heart and arteries.

ries. It differs from natural sleep by coming on suddenly, without previous fatigue\*, and by the difficulty or impossibility of rousing the patient. The coma which succeeds an epileptic paroxysm, has a strong resemblance to apoplexy, but may be ascertained by attending to the previous convulsions.

DRUNKENNESS exhibits phenomena so similar to those of this disease, that they have often alarmed, and sometimes misled physicians of experience, when called to persons of whom no account could be given.

IN many cases, the breath is so strongly impregnated with the odour of the intoxicating liquor, that the cause of the disease is easily conjectured; but in other cases, as those of ebriety from strong beer or porter, the breath does not afford this distinguishing mark, and unless the physician suspects the cause, from the hardness and tension of the pulse, he may remain for hours in painful uncertainty.

THE effects produced by large doses of opium, and other narcotics, resemble so strongly those of apoplexy, that it was supposed by many physicians that these substances occasioned death, by producing effusion within the cranium. Dissections have ascertained the fallacy of this opinion,

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\* Dr. Rush's Lectures,

but the difficulty of distinguishing between the effects of those different causes is very considerable. Experience, so justly valued by physicians, may possibly enable them to decide from certain circumstances in the aspect \* of patients, which are not to be described ; perhaps the pulse may also afford a criterion. Appearances like those of apoplexy have been brought on by overloading the stomach with food difficult to digest. In this case, the patient often exhibits marks of oppression or uneasiness of his stomach, and the pulse is not so slow and full † as in apoplexy. It will however be proper in every case of this kind, which comes on soon after eating freely, to unload the stomach, by giving warm water in large draughts, or gentle emetics, if vomiting cannot be excited otherwise.

## PREDISPOSING CAUSES.

THEY are such powers as occasion a preternatural accumulation of blood in the head. Some of the most important of these, are the various circumstances which produce general plethora, such as,

*Intemperance in eating and drinking ;* which by producing a large quantity of chyle, must increase the general mass of blood, while the stomach, distended

\* The countenance of persons who have taken large doses of opium, is generally livid.

† Dr. Kuhn's Lectures,

distended with aliment, compresses the vessels and viscera of the abdomen, and at the same time hinders a free motion of the diaphragm, whereby the lungs being less easily dilated, the venal blood cannot return so freely from the head: thus we see, after plentiful feasting, all the guests have their faces flushed and turgid, and their eyes red, and sometimes they become sleepy and stupid. The daily repetition of feasting will thus keep up a strong predisposition. The worshippers of Bacchus have been seized with a fit, while they were making merry over their jovial cups.

*Indolence, with a full diet*, generally produces plethora, and therefore predisposes to this disease.

*Stoppage of any usual evacuation*; as the bleeding piles, bleeding from the nose after it has become habitual, by producing fulness in the system, is also a predisposing cause of this disease.

THERE are other causes which appear to have a partial operation upon the head.

*Old age* seems to predispose to this disease, in consequence of a determination to the head, which takes place very often, although the causes are not always evident.

*A large head* is supposed to be a circumstance which predisposes to apoplexy, and it is generally

ly believed that this disease occurs more frequently in such cases, than in others. Perhaps the uncommon size of the head is only an effect of the predisposing cause, and is rather to be considered as produced by the determination of the blood, than as occasioning it.

*A short neck* is said to occasion a predisposition to apoplexy; and this idea will appear probable when we reflect that in consequence of it, the heart must be nearer the head, and the blood of course will flow to it with more force, while at the same time the return of the blood, through the veins of the neck, is more easily interrupted.

*Corpulency* is mentioned as another predisposing cause, and it is supposed to produce this effect, by compressing the vessels in all parts of the body but the head, of course therefore blood must accumulate there: perhaps by impeding respiration, it may delay the return of that fluid from the head.

*Cold and wet feet* produce a languid circulation, and diminish the quantity of blood in the lower extremities, therefore there will be a greater flow of it to the head.

*Painful and long application of the mind to one subject* very often excites a determination to the head.

MORGAGNI mentions the case of a learned man, who if at any time he fixed his mind on abstruse speculations, before he rose in a morning, had always some drops of blood falling from his nose, when he got up.

## THE EXCITING CAUSES

EITHER increase the impetus of the circulation in the head, or suddenly augment the quantity of blood in it. Among these may be reckoned,

*Violent exercise*, which acts in the manner first specified, by quickening the general circulation.

*The general application of heat* probably produces its effects in the same manner.

*Heat partially applied to the head* often excites apoplexy, as in persons exposed to the rays of the sun.

*Violent passions of the mind*, as anger. This appears particularly to determine the flow of blood to the head, as is evinced by the florid colour of the face.

*Stooping too long at a time, or laying with the head low*, may produce an accumulation of blood in it by impeding its return from the brain.

*Any*

*Any violent and sudden exertion*, by producing a long inspiration, will retard the passage of the blood through the lungs from the right side of the heart, and of course will interrupt the return of blood from the head. This is also evident by the appearance of the face.

*Flexion and twisting of the neck*, or any other situation of it which will compress the internal jugular veins, by obstructing the passage of the blood in them, will bring on apoplexy; as will also ligatures when drawn too tight round the neck. *Tumours on the neck* act in the same way.

*Extreme intoxication, indigestible food lying in the stomach, and breathing in a crowded assembly*, appear frequently to be exciting causes of apoplexy, although it is not easy to explain the manner in which they produce effusion. The different narcotic substances sometimes produce the same effect.

*Vomiting* is often a powerful exciting cause of apoplexy, as all the contents of the abdomen are compressed violently, while the diaphragm and abdominal muscles are convulsed, the blood in the ascending cava will be sent with more force to the right side of the heart, thereby impeding the discharge of blood from the descending vein, and the descending aorta will also be pressed, and therefore give the blood a greater determination to the head;

head ; while at the same time the respiration being obstructed during vomiting, the right ventricle of the heart cannot discharge its blood into the pulmonary vessels ; hence the return of venal blood from the head is impeded, while there is at the same time a great quantity sent up by the large arteries, and apoplexy is often the consequence from a rupture of some of the vessels of the brain.

### APPEARANCES ON DISSECTION.

WE have many histories of dissections performed by various authors on patients who died of apoplexy, and especially by *Morgagni*, who has treated very fully on this subject, I shall therefore refer generally to him, and content myself with describing the phenomena which most frequently occur, without further reference.

UPON dissecting those who have died of this disease, the following circumstances have been observed. The vessels of the plexus choroides are often distended, and bodies similar to hydatids in other places have been found connected with them, sometimes containing red blood, at other times a quantity of fluid, similar to serum. There is sometimes, though rarely, an effusion of pus in the brain. Large tumours have also been found, and the brain is sometimes flaccid and softer than natural.

THE arteries and veins are generally found much distended with blood, a quantity of extravasated blood or serum is almost always found either between the cranium and dura mater, the dura and pia mater, or in the cavities or ventricles of the brain. By the dissections of *Morgagni* it appears, that blood has been found effused in every part within the cranium : and *Hoffman*, supposing this always to be the case, gave this disease the name of hæmorrhagia cerebri.

MORGAGNI relates some cases, where the brain appeared as if corroded, but he says there was always blood found in the cavities produced by corrosion, which makes it probable, that those cavities were produced by that extravasated blood.

## PROXIMATE CAUSE.

THERE is a great difference amongst authors, with respect to the proximate cause of diseases, and it appears to be a branch of medicine not yet well understood. Thus, in the present case, while some suppose this disease to depend on an asthenic diathesis, others who claim no less attention, firmly adhere to and embrace the contrary opinion, and *Hoffman*, thinking it always to depend on hæmorrhagy, gave it the same proximate cause as hæmorrhagy in other parts of the body.

DOCTOR

DOCTOR *Cullen* supposes the proximate cause to be whatever interrupts the flow of the nervous power to the muscles of voluntary motion, or destroys the mobility of this power. And from daily observation we see, that whenever compression is suddenly applied to the brain\*, there is loss of sense and motion; this fact alone is sufficient to prove that the brain is the part from whence these powers are derived, though we cannot demonstrate its *modus operandi*, and whatever produces that state of the brain, in which the functions thereof are suspended, appears to be the proximate cause; this I suppose to be a preternatural accumulation of blood or serum, most commonly effused from the vessels of the brain, but *sometimes* contained in them. When excess of action exists, there is generally an effusion of blood or serum, when defect of action, only distention of the vessels from some obstructing cause, retarding the free return of blood from the head to the heart.

HOFFMAN supposes this disease in every case to be preceded by a debility of the vessels and membranes of the brain. He adds, "while these preserve their tone, the remote and occasional causes will have but little influence."

THIS debility is often hereditary, affecting particular families, but it is more frequently ac-  
C
quired

\* Dr. Physick's Thesis, page 15.

quired by irregularity in living, particularly by excess in eating and drinking.

## PROGNOSIS.

IN some cases of this disease, it is almost impossible to foretell the event; but in others the prognosis may be made with more certainty, and we should always take into consideration the following circumstances: First, the age, strength, constitution and former habits of the patient. Secondly, the symptoms, nature and duration of the disease. Thirdly and lastly, its particular remote causes.

IF the coma and other symptoms are slight, and the strength not much exhausted, there are some hopes of a cure; but if the symptoms continue violent for some days, apoplexy generally terminates in death or some other disease; and before death, the pulse which all along had been full and slow, becomes quick and frequent.

THE commonly received opinion, that the patient cannot survive the third fit, seems to be without good foundation, as it entirely depends on the violence of the paroxysms and not on their number, and the patient is to be reckoned more or less dangerous in proportion to the diminution of his senses. A very slow or a very frequent pulse is unfavourable, an unequal and  
very

very weak pulse generally denotes approaching death. When the sphincters of the anus and bladder are relaxed in the beginning of the attack, death generally ensues. When the patient has lost the power of deglutition, it denotes a violent disease; and lastly, when there is a cold and clammy sweat, the face having a cadaverous appearance, the eyes flaccid and dull, there is scarcely any hope of recovery. When the disease depends on the sudden cessation of any usual evacuation, and this returns, together with a gentle and equable sweat, the prospect is more favourable. Copious discharges of urine containing a sediment, spontaneous evacuations of the bowels, and violent spontaneous vomiting, have brought on a resolution of the disease.

### METHOD OF CURE.

THIS disease requires the utmost attention and regard from physicians, for it is very often fatal, and he who hath sustained the slightest attack of it, seldom or never escapes with the same integrity of constitution he enjoyed before.

THE cure divides itself into two parts. The first is, to relieve the patient during the fit; the second, to prevent its return.

THE following remedies seem likely to answer the first indication.

*Bleeding.*

*Bleeding.* This is as necessary here as in inflammatory fever, or hæmorrhagy. Bleeding from the jugular, occipital and frontal veins, or temporal arteries, have been recommended, but this is often inconvenient and seldom practised; instead thereof bleeding in the arm, or in both arms at once, has been substituted. This operation should be performed as soon as possible after the attack, before much effusion can have taken place, or the vessels have been so much dilated as to acquire an atonic state: The quantity drawn should always be accommodated to the fulness and state of the pulse. Bleeding should always be most copious in cases which happen from falls and contusions, in which there was not great predisposing debility.

*Cupping and scarifying* the temples and back part of the head, should be used, if bleeding has been practised, as much as the strength would permit, without removing the symptoms.

*Purges* are of the greatest service in this disease, and they should be of a powerful kind. They act not only by evacuating the contents of the intestines, but generally the head is relieved in proportion to the quantity of fluid they discharge. They have been objected to, but experience has proved their usefulness, and they should be often repeated.

*Blisters* should be applied early in apoplexy. If they produced their effects by giving a general stimulus, as is commonly supposed, they would certainly be injurious, but observation has taught us, that they produce little irritation except upon the part to which they are applied; and therefore are so frequently used in phrenitis, pneumonia and hæmorrhagy. In the case of apoplexy, they should be applied to the whole head. They seem to produce their good effects by the evacuation they occasion. The head should be shaved some time before their application,

*Cold water* dashed on the head seems to be useful; and we find the temporary apoplexy brought on by intoxication is often cured by boys pumping or pouring cold water on the heads of those miserable wretches who are affected with it. From analogy we may conclude it to be of service; its use is acknowledged in almost all cases of excess of action, but particularly in phrenitis.

THE patient should be placed in an erect posture, that the blood may flow as easy as possible from the head. All ligatures should be removed, especially the neck-cloth.

*Cool and fresh air* is to be applied; a moderate temperature, together with pure air, is found necessary in almost all diseases; and in this case  
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it is of the utmost consequence. The good effects are evident, when we consider that people are often seized with a fit of apoplexy after breathing sometime in a crowded assembly. It may have some effect in diminishing the action of the heart and arteries.

*The lower extremities* are carefully to be defended from cold, and a crowd of people ought not to be suffered to surround the patient.

IN those violent cases in which life seems to be almost extinguished, cataplasms of flour of mustard, and other stimulating substances, applied to the palms of the hands and soles of the feet, have been found useful, by rousing and exciting the patient\*.

I SHALL now proceed to consider the method of preventing the fits. And as there are two states of action, on which this disease may depend, the method of prevention must be regulated by them, as well as by the other remote causes.

AND first, persons of a full and plethoric habit should observe temperance in eating and drinking; they should pay strict attention both to the quantity and quality of their food; they should avoid filling their stomachs particularly before going to bed. If they have been accustomed to  
take

\* See Hoffman, page 451.

take supper, they should eat very light food, such as fowls and veal, or rather vegetables of easy digestion, in moderate quantities.

IF the patient has been accustomed to drink wine or other liquors, they should not suddenly be abstained from, but must be used in small quantities, and diluted with water; wine should be used in preference to beer or porter, or any malt liquor, as lighter and less nutritious. Violent exercise of every kind should be avoided, such as running, jumping, &c.

RIDING or walking is the best exercise. Sudden passions of the mind, as terror, anger, &c. should by all means be avoided. Issues and setons have been found useful, they should be applied to the nape of the neck.

ALL the occasional causes are to be avoided, such as cold and wet feet, tight ligatures, intense study, &c. If a person has been accustomed to have an evacuation from the hæmorrhoidal vessels, or any other part, and that should suddenly cease, he should either bring back the accustomed discharge, or substitute another. Old habits and customs are not to be changed suddenly. Persons who are of a weakly habit, and have symptoms of fullness in the head, should observe temperance, and use gentle exercise, and every other means of restoring the tone of the system.

If the precursory symptoms above mentioned should occur, notwithstanding means to obviate them have been used, the person should lose some blood, take a purge, and make use of a vegetable diet.

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